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AMENDMENTS  
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IN THE CLAIMS:

1. (Amended) A method for screening for drugs for the treatment of Alzheimer's disease, said method comprising:

contacting ~~mutant~~ hippocampal cells, with a presenilin gene mutation having enhanced synaptic potentiation upon stimulation as compared to wild-type hippocampal cells with a candidate drug;

a1  
subjecting said mutant hippocampal cells to tetanic stimulation; and  
determining the effect of said [agent] candidate drug on the synaptic potentiation of said mutant hippocampal cells;

wherein a reduction in the enhanced synaptic potentiation of the mutant hippocampal cells is indicative of activity of a candidate drug for the treatment of Alzheimer's disease.

2. Please cancel Claim 2. [A method according to Claim 2, wherein said mutant cells are mutated in a presenilin gene.]

3. (Amended) [A] The method according to Claim 1, wherein [said mutant cells are] mouse hippocampal tissue slices comprise said mutant hippocampal cells.

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4. (Amended) [A] The method according to Claim 1, wherein said enhanced synaptic potentiation is a result of a change in the GABA<sub>A</sub> receptor pathway.

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5. (Amended) A method for screening for drugs for the treatment of Alzheimer's disease, said method comprising:

contacting mutant hippocampal cells, with a presenilin gene mutation having enhanced synaptic potentiation upon stimulation as compared to wild-type hippocampal cells with a candidate drug;

subjecting said mutant hippocampal cells and said wild-type hippocampal cells to a tetanic stimulus;

measuring changes in potentiation with time of the mutant hippocampal cells and wild-type hippocampal cells and comparing the effect of said [agent] candidate drug on the synaptic potentiation of said mutant hippocampal cells as compared to the observed synaptic potentiation of said wild-type hippocampal cells;

wherein a reduction in the enhanced synaptic potentiation of the mutant hippocampal cells as compared to the synaptic potentiation of the wild-type cells is indicative of activity of a candidate drug for the treatment of Alzheimer's disease.

6. (Amended) A method for determining whether a mutation in hippocampal cells acts on a common pathway with a GABA<sub>A</sub> receptor antagonist, said method comprising [according to Claim 5, including the additional steps of]:

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contacting mutant hippocampal cells, with a presenilin gene mutation having enhanced synaptic potentiation upon stimulation as compared to wild-type hippocampal cells with a GABA<sub>A</sub> receptor antagonist;

subjecting said mutant hippocampal cells and said wild-type hippocampal cells to tetanic stimulation; and

measuring changes in synaptic potentiation with time of [the] said mutant hippocampal cells and said wild-type hippocampal cells and comparing the effect of said GABA<sub>A</sub> receptor antagonist on said mutant hippocampal cells and said wild-type hippocampal cells; wherein a reduction in the enhanced synaptic potentiation of the mutant hippocampal cells without a "significant change" in the synaptic potentiation of the wild-type cells is indicative of the mutation acting on a common pathway with said GABA<sub>A</sub> receptor antagonist.

7. (Amended) [A] The method according to Claim 5, wherein said [agent] candidate drug is present with said wild-type hippocampal cells.

8. (Amended) A method for screening for drugs for the treatment of Alzheimer's disease, said method comprising:

contacting mutant hippocampal cells, with a presenilin gene mutation having enhanced synaptic potentiation upon stimulation as compared to wild-type hippocampal cells with a candidate drug;

subjecting said mutant hippocampal cells and said wild-type hippocampal cells to a tetanic stimulus at a first potential of glutamate currents and a second potential of GABA<sub>A</sub> currents;

measuring the synaptic response at each of the first and second potentials for [the] said mutant hippocampal cells and said wild-type hippocampal cells and comparing the effect of said [agent] candidate drug on said mutant hippocampal cells and said wild-type hippocampal cells; wherein a reduction in the enhanced synaptic response of the mutant hippocampal cells without a significant change in the synaptic response of the wild-type cells is indicative of activity of a candidate drug for the treatment of Alzheimer's disease.

9. (Amended) A method for screening for drugs for the treatment of Alzheimer's disease, said method comprising:

contacting mutant mouse hippocampal cells mutated in the presenilin-1 gene and having enhanced synaptic potentiation upon tetanic stimulation as compared to wild-type hippocampal cells, with a candidate drug;

subjecting said mutant hippocampal cells and said wild-type hippocampal cells to tetanic stimulation; and

comparing the effect of said [agent] candidate drug on said mutant hippocampal cells and said wild-type hippocampal cells upon tetanic stimulation;

wherein a reduction in the enhanced synaptic potentiation of the mutant hippocampal cells without a significant change in the synaptic potentiation of the wild-type cells is indicative of

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activity of a candidate drug for the treatment of Alzheimer's disease.

10. (Amended) Slices of mouse hippocampal tissue containing cells having a mutation in a presenilin gene combined with a candidate drug that is not an antibody.

11. (Amended) Slices of mouse hippocampal tissue containing cells according to Claim 10, after tetanic stimulation.

12. (Amended) Slices of mouse hippocampal tissue containing cells according to Claim 10, wherein said mutation is [the] a PS-1  $\Delta 9$  mutation.

Add new Claim 13.

13. A method for screening for drugs for the treatment of Alzheimer's disease, said method comprising:

contacting slices of mouse hippocampal tissue containing cells, having a PS-1  $\Delta 9$  mutation and having enhanced synaptic potentiation upon stimulation as compared to wild-type hippocampal cells with a candidate drug;

subjecting said mutant hippocampal cells to tetanic stimulation; and

determining the effect of said candidate drug on the synaptic potentiation of said mutant hippocampal cells;

wherein a reduction in the enhanced synaptic potentiation of the mutant hippocampal cells is indicative of activity of a candidate drug for the treatment of Alzheimer's disease.

### REMARKS

#### The Claimed Invention:

The claimed invention is directed to methods for screening for drugs for the treatment of Alzheimer's disease, and to slices of mouse hippocampal tissue containing cells having a